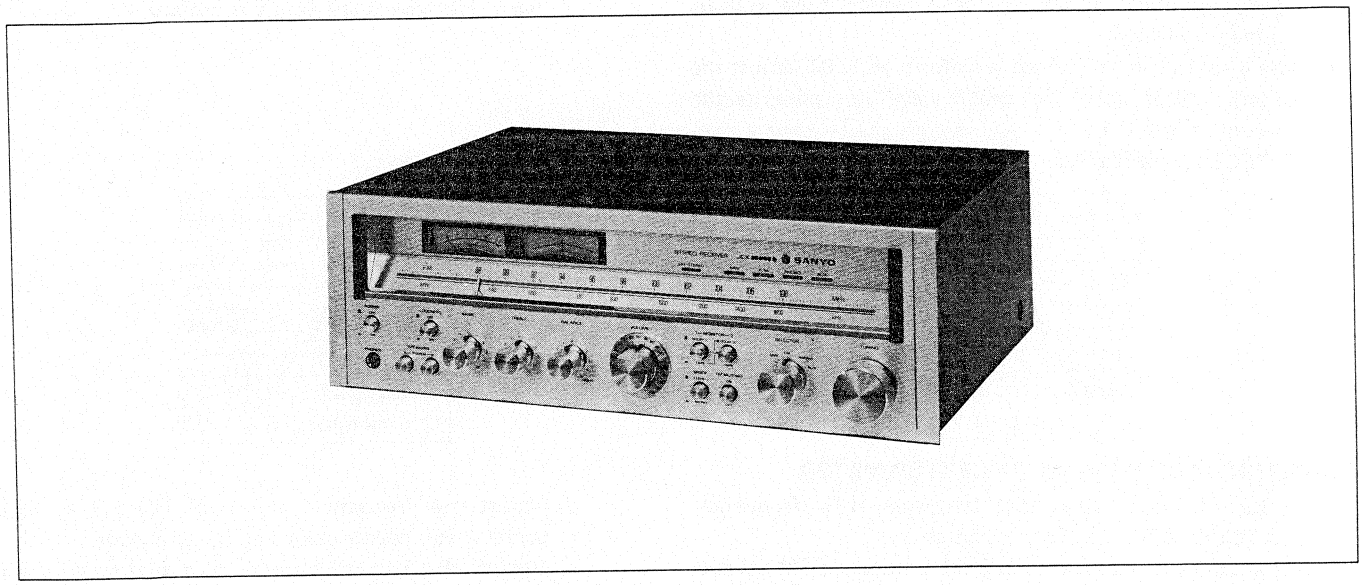
SERVICE MANUAL

SANYO

STEREO RECEIVER

JCX2250KZ

(EUROPE)



SPECIFICATIONS

Amplifier Section

Output power	70 watts (Total music power at 8 ohms) 30 watts x 2 (IHF Continuous power at 8 ohms)
Frequency response	20Hz/30kHz
Total harmonic distortion	0.4%
Input sensitivity and impedance	
Phono	2.5mV/50k ohms
Aux	150mV/50k ohms
Tape Play	150mV/50k ohms
Tape 2 Rec/Play	150mV/50k ohms
Output	
Tape Rec	150mV
Tape 2 Rec/Play	0,5mV/k ohms
Overall frequency response	
Phono RIAA 30Hz – 15kHz	±0.2dB
Aux 20Hz – 30kHz	±0.2dB
Tape Play 20Hz – 30kHz	±0.2dB
Tone control response	
Bass at 100Hz	±10dB
Treble at 10kHz	±10dB
Loudness control response	
Volume set –30dB at 100Hz	+8dB
Volume set –30dB at 10kHz	+4dB
Hum and noise ratio (IHF, short-circuited, A network)	
Phono	70dB
Aux	90dB
Tape Play	90dB

FM Tuner Section

Frequency range	87.5 – 108MHz
Usable sensitivity	1.9μV (10.8dBf) (Mono)
Signal-to-noise ratio (at 65 dBf)	
at Mono	70dB
at Stereo	67dB
Harmonic distortion (at 65 dBf)	
at Mono	0.3%
at Stereo	0.4%
AM suppression (30% 400Hz AM)	55dB
Spurious response	80dB
Alternate channel selectivity	60dB
Image rejection at 98MHz	50dB
IF rejection at 98MHz	55dB
Capture ratio	1.0dB
Stereo separation at 1kHz	40dB
	40dB
Antenna input	300 ohms balanced 75 ohms unbalanced

MW Tuner Section

Frequency range	510 – 1605kHz
Sensitivity	300μV/m
Signal-to-noise ratio	50dB
Image rejection	48dB
IF rejection	50dB
Selectivity	33dB
Antenna	Built-in ferrite bar antenna, External antenna input

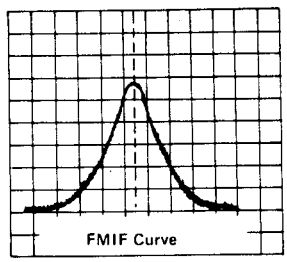
General

Power requirements	AC: 115/220V, 50/60Hz
Power consumption	180W
Dimensions	17-3/8"W x 5-7/8"H x 13"D (440 x 146 x 330 mm)
Weight	Approx. 20 lbs. (9 kg)

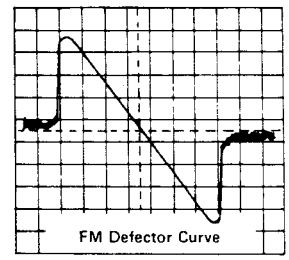
* Specifications subject to change without notice.

FM IF ADJUSTMENT

1. V curve adjustment
   1) Connect TP3 (Hot) and TP6 (Eartch) to the output terminal of the sweep generator, and TP4 (H) and TP9 (E) to the input terminal.
   2) Connect a resistance load of about 10 to 50 K-ohms to the input of the sweep generator and disconnect the tuning meter lead wires from the circuit board.
   3) Cut off ceramic filter C213 (0.022μF) at one end.
   4) Make adjustment while keeping the output from the sweep generator at the low level (where noise appears on the waveform).
   5) While watching the sweep waveform at T201, adjust the ceramic filter until the sweep waveform presents the pattern as in Fig.1.
      * TP6 is a shield plate.



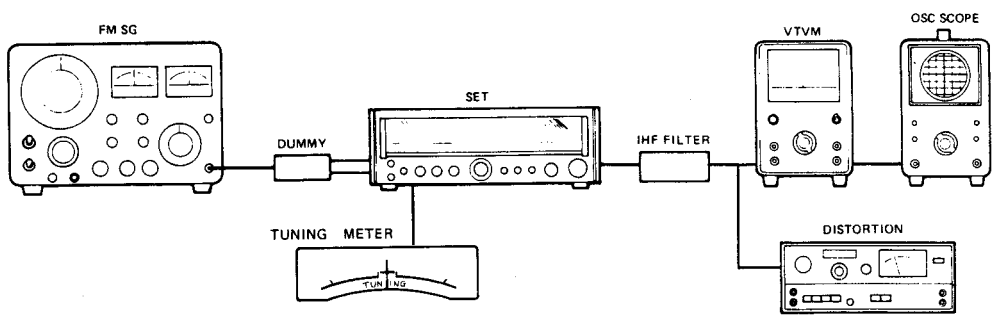
2. S curve adjustment
   1) Connect TP3 (H) and TP6 (E) to the output the sweep generator. Connect TP9 (E) and TP10 (H) to its input.
      NOTE: It is necessary to connect to the input of the sweep generator a capacitor (1μ/16V) for cutting DC current.
   2) Adjust the primary core (on the pattern side) of dual tuning coil T202 until the S curve presents the pattern as in Fig. 2. Avoid turning the secondary core (on the parts side) unless absolutely necessary.



ZERO-POINT ADJUSTMENT OF CENTER METER

Set FM SG as follows: modulation frequency 1kHz, frequency deviation 75kHz DIV. (100% modulation).
Connect a balanced dummy of 300 ohms between FM SG and the unit (at the 300-ohm terminal of the external antenna).
Then, connect the center meter to the unit at the center meter output terminal.

1) Set the tuning dial of the unit to 98MHz (where no broadcasting signal is coming in).
2) While keeping the FM SG output level to 0 (less than-10dB), adjust the primary core (on the pattern side) of T202 until the center meter needle stands at the zero point.
3) Adjust the frequency output of FM SG so that the center meter needle stands at the zero point.
4) Reduce the distortion factor to a minimum by turning the secondary core (on the parts side) of T202. Make this adjustment at the FM SG output level of 40 60dB.
5) Repeat steps 2) and 3) above.
6) Set the FM SG output level to 60dB. Turn T201 until the distortion factor becomes minimal.
   * T201 should be adjusted only slightly. If it has been turned more than necessary, go through the above steps from 1).
7) Repeat steps 2) and 3).



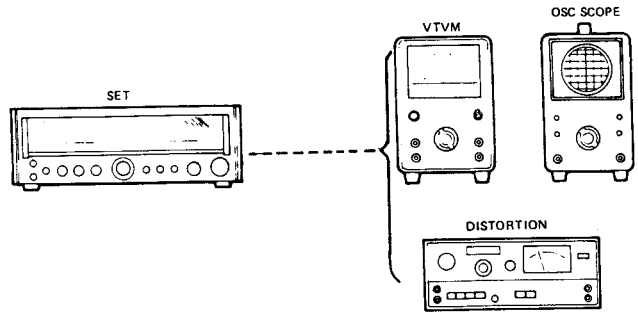
FM TRACKING

Set FM SG as follows: modulation frequency 1kHz, frequency deviation 75kHz DIV. (100% modulation).
Flip the MODE switch of the unit to "MONO". Connect FM SG and a dummy load as instructed in 3. Zero-point adjustment of center meter.
Such testers as VTVM should be connected to the unit at the TAPE REC output terminal (RCA pin).

* The total load impedance of the testers connected to the unit at the REC output terminal should be 100 K-ohms.

1) Make LOW TRACKING adjustment by means of L102 and L101. Use 90MHz FM signal for this purpose.
2) Make HIGH TRACKING adjustment by means of CT2 and CT1. Use 106MHz FM signal for this purpose.
3) Make complete TRACKING adjustment by repeating steps (1) and (2).

* When properly adjusted, the distortion factor of the output from the unit is reduced to a minimum, provided that the distortion factor of the SG output is anout 3%.



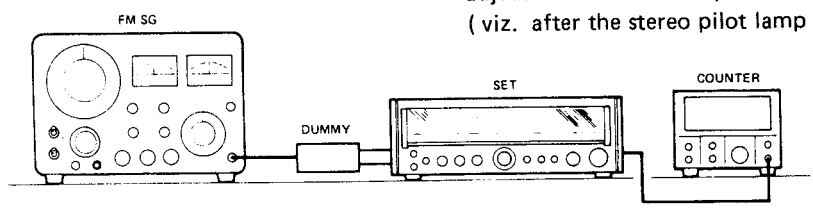
FM MPX ADJUSTMENT

For this adjustment, set the FM SG output to "0" (OFF) the muting switch of the unit to ON. The output from the unit to the frequency counter should be taken out at TP5 (H) and the tuner earth (E) (i.e. the switch case or the ground point near the tuner).

Adjust SVR309 until the frequency counter reading becomes 19,000Hz ±19Hz.

* For this adjustment, use a frequency counter relatively high in input impedance.

* Do not make this adjustment immediately after setting to ON the POWER switch of the unit. First, stereo signal from FM SG, keep the stereo pilot lamp of the unit glowing (for more than 10 seconds) and make FM MPLX adjustment immediately after switching off the SG output (viz. after the stereo pilot lamp has gone out).

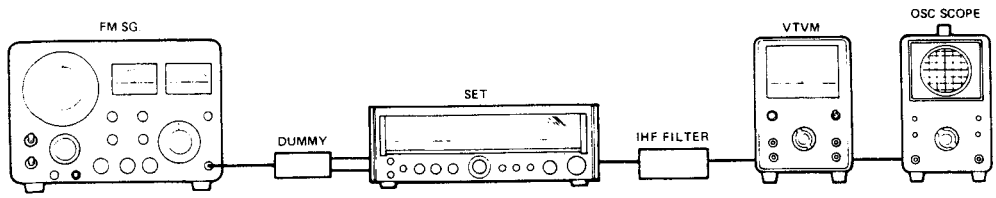


FM MUTING LEVEL ADJUSTMENT

Set FM SG as follows: modulation frequency 1kHz. frequency deviation 75kHz DIV. (100% modulation). Then, set the muting switch of the unit to ON.

1) Set FM SG to 98MHz and tune the unit to that frequency level.
2) Apply 5μV to the 300-ohm terminal of the external antenna.
3) Turn SVR227 and set it at the position where the VTVM needle stops swinging or the wave pattern on the oscilloscope becomes very small.

* When the muting function is on, the waveform decreases in size, and weak signals and noise are cut off.



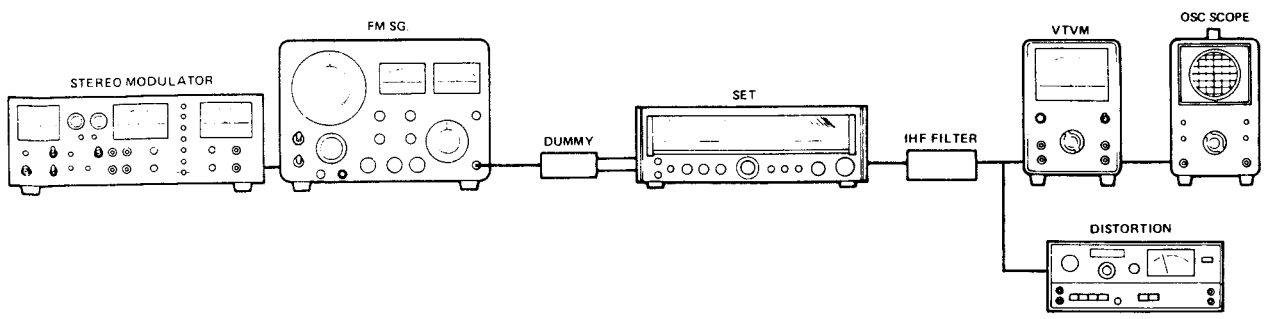
SEPARATION

Set FM SG as follows: modulation frequency 1kHz, frequency 98MHz. Set the pilot signal of the stereo modulator to a modulation degree of 9%. PL + L + R = 75kHz DIV. (9% + 91%)

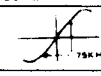
Select the "STEREO" mode by the mode switch of the unit.

1) Set the input to the unit (i.e. voltage at the 300-ohm terminal of the external antenna) to 60dB (This corresponds to 66dB in terms of FM SG output.)
2) Generate L-R signals by the stereo modulator and tune the unit completely to their level. (In this state, the distortion factor is reduced to a minimum.)
3) Switch the stereo modulator from R to L channels. Reduce signal output leakage of each channel to a minimum by adjusting SV306.

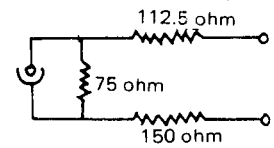
* When making this adjustment, use a filter (e.g. IHF filter 200 15kHz) and eliminate 19kHz and 38kHz carrier components.



FM ALIGNMENT

Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	I. F.	Connect sweep generator to FM ANT terminal	Connect oscilloscope to test point	≒10.7MHz (0% modulation Tune to ceramic filter frequency	Near max. capacity of VC. at position with no unrequired signal.	T201	Match waveform with Center of ceramic filter
2	Ratio Det.		Connect oscilloscope to test point			T203	
3	O. S. C.	Connect FM SG. to FM aerial. Terminals	Connect VTVM to speaker terminal.	87 MHz (400 Hz 30% modulation)	Low end of dial scale	L103	Max.
4				109 MHz (400 Hz 30% modulation)	High end of dial scale	CT-3	
5	ANT.	Connect FM SG. to FM aerial. Terminals	Connect VTVM to speaker terminal.	90 MHz (400 Hz 30% modulation)	90 MHz on dial scale	L101 L102	Max.
6				108 MHz (400 Hz 30% modulation)	108 MHz on dial scale	CT-1 CT-2	
7	Repeat adjustments.						

PREPARE:
1. Add to AC 240V 50 Hz
2. Set the dial pointer to very left line of dial scale.
3. Connect sweep generator, FM SG. VTVM and oscilloscope. FM aerial input impedance is 75 ohm.
4. Use a screwdriver with plastic grip for all adjustments.
5. Use a 300 ohm balanced dummy load.



MW ALIGNMENT

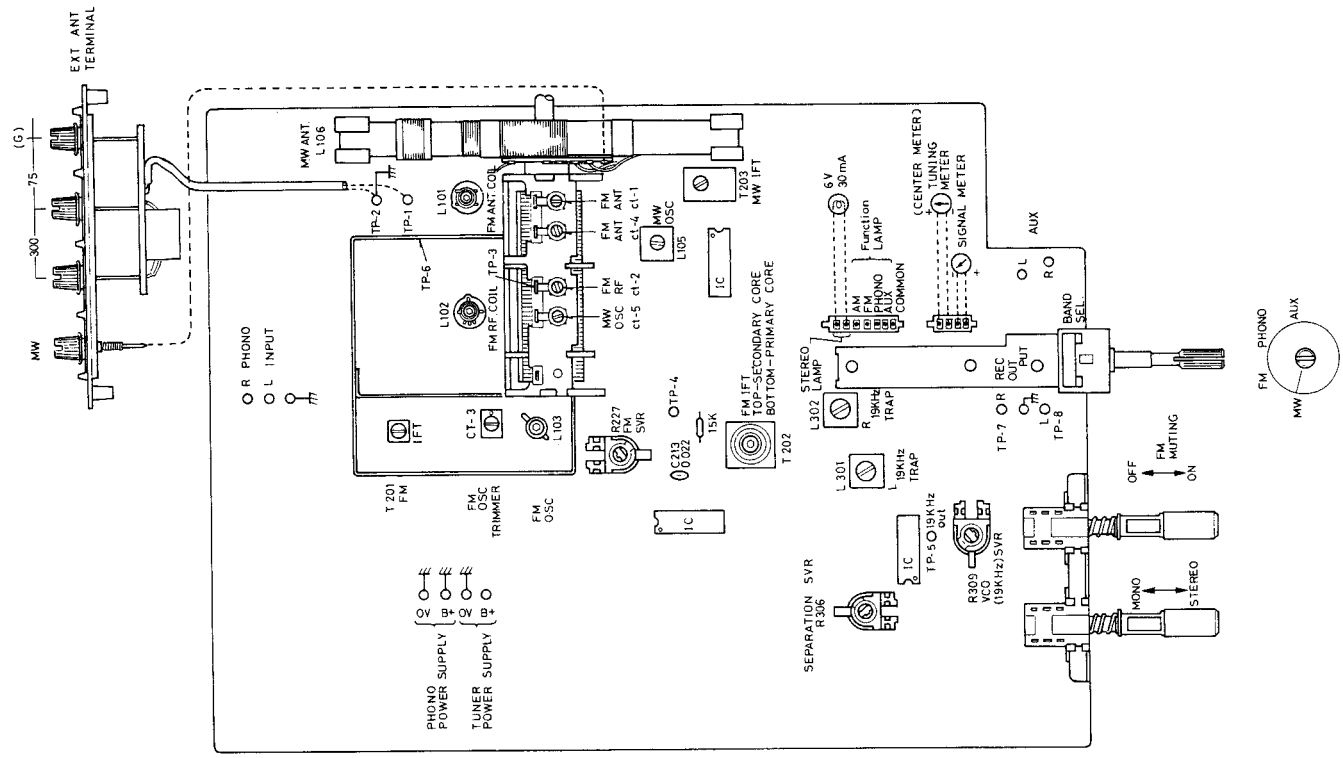
Step	Adjusting Circuit	Connections		SG frequency	Position of tuning dial	Adjustment	VTVM Oscilloscope
		Input	Output				
1	I. F.	Connect sweep generator to TEST LOOP.	Connect oscilloscope to EXT. SP.	455 KHz (400 Hz 30% modulation)	Low end of dial scale at position of no unrequired signal.	T202	Max.
2	O. S. C.	Connect MW SG. to TEST LOOP.	Connect VTVM to EXT. SP. terminals	505 KHz (400 Hz 30% modulation)	Low end of dial scale	L105	Max.
3				1700 KHz (400 Hz 30% modulation)	High end of dial scale	CT-5	
4	ANT.	Connect MW SG. to TEST LOOP.	Connect VTVM to EXT. SP. terminals.	600 KHz (400 Hz 30% modulation)	600 KHz on dial scale	L106	Max.
5				1400 KHz (400 Hz 30% modulation)	1400 KHz on dial scale	CT-4	
6	Repeat adjustment						

PREPARE:
1. Add to AC 240V 50 Hz.
2. Set the dial pointer to very left line on dial scale.
3. Use a screwdriver with plastic grip for all adjustments.
4. Selector switch to "MW".
5. Connect sweep generator, MW SG, VTUM and oscilloscope.

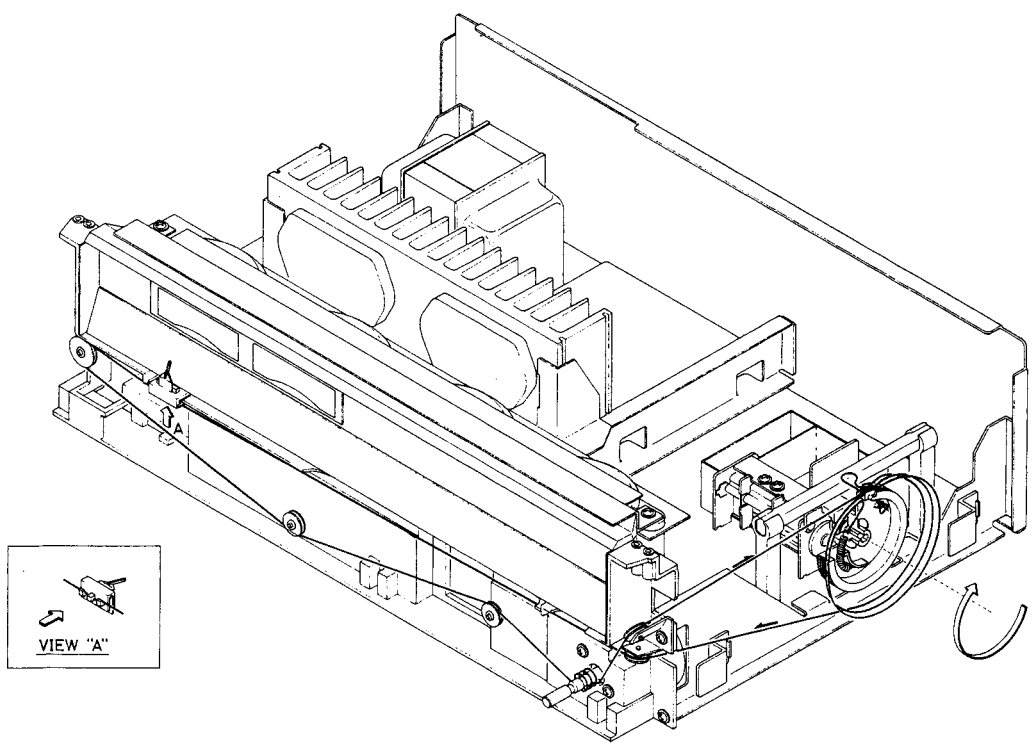
19 KHz TRAP ADJUSTMENT

Apply 19 KHz signal to FM SG from the audio frequency oscillator, adjust coil (L301, L302) to obtain an output of minimum at REC output terminals.

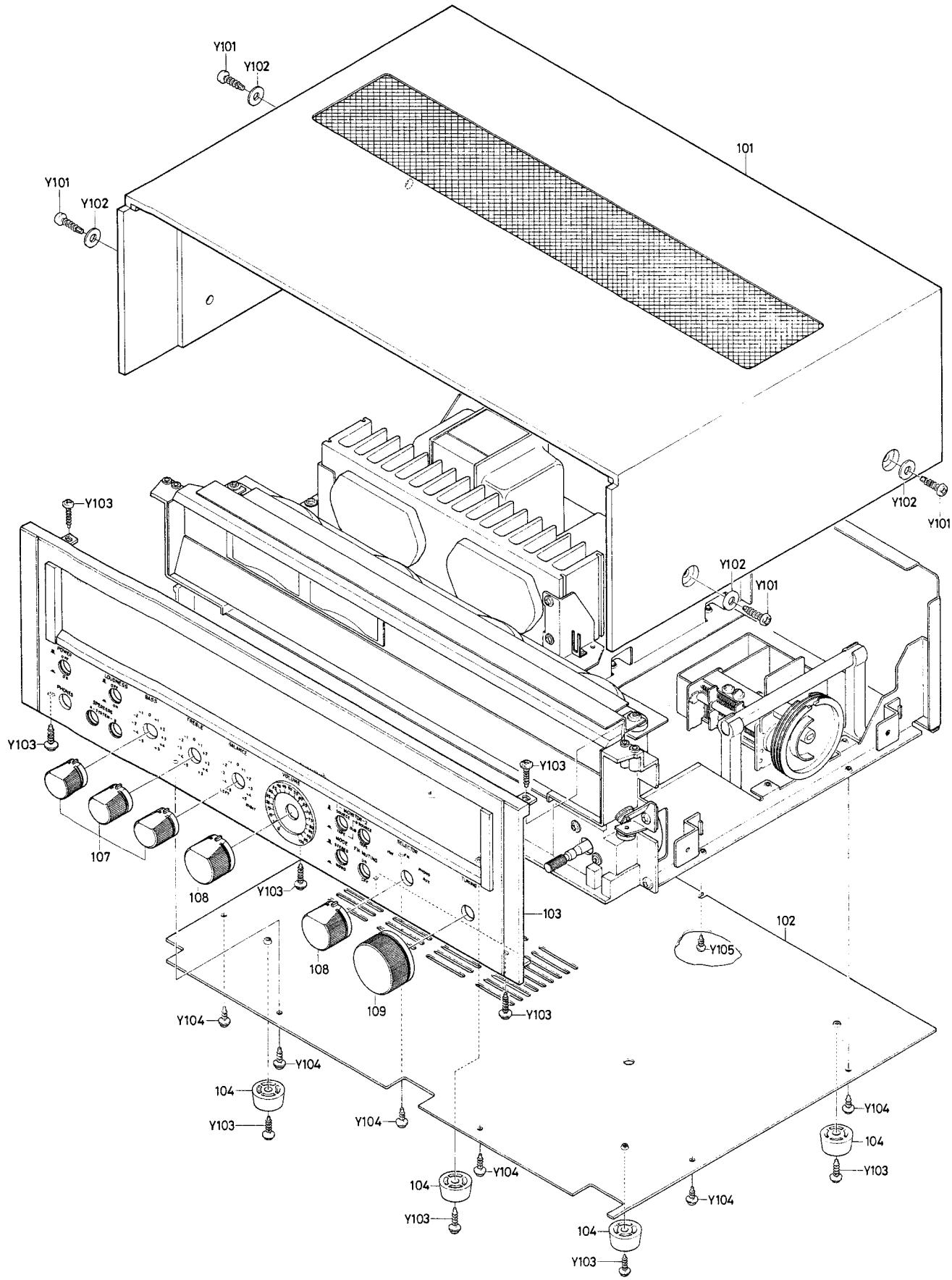
PARTS LOCATION



DIAL CORD STRINGING



CARINET EXPLODED VIEW



PARTS LIST

Ref. No.	Part No.	Description	Q'ty
PACKING			
	141-6-132T-88201	Individual Carton	1
	141-6-144T-38100	Styrol Filler	2
	141-6-231T-25300	Inner Polyethylene Bag, Printed Matter	1
	141-6-410T-10801	Instruction Bookelt	1
	141-6-231T-55700	Inner Polyethylene Bag, Set	1
	141-6-415T-15600	Notice, Fuse	1
	141-6-231T-06100	Inner Polyethylene Bag	1
	4-245T-00171	Antenna, FM	1
	4-234T-06171	Fuse 2.5A	2
	123-6-453R-00100	Inspection Sheet	1
	141-6-317T-10250	Inner Polyethylene Bag.	1
	141-6-415T-16200	Notice	1
CABINET & CHASSIS			
101	141-0-111T-31600	Cabinet Assembly (141-0-111T-11800)	1
102	141-2-125T-11200	Bottom Lid	1
103	141-0-122T-18500	Front Panel Assembly	1
104	141-0-174T-04701	Stand Assembly	4
105	141-2-153T-31200	Escutcheon, Both Sides of Dial Scale	2
106	141-2-411T-08800	Plate Nut	1
107	141-0-163T-39500	Rotary Knob Assembly, Bass & Treble & Balance (141-0-163T-12300)	3
108	141-0-163T-39600	Rotary Knob Assembly, Volume & Selector (141-0-163T-12400)	2
109	141-0-163T-39700	Rotary Knob Assembly, Tuning (141-0-163T-12500)	1
110	141-0-146T-12800	Dial Scale Assembly (141-9-146T-01700)	1
111	141-2-329T-04500	Reflector, Dial	1
112	141-2-328T-05200	Shield Light	1
113	141-0-511T-12100	Pointer Assembly (141-9-511T-00400)	1
114	141-2-246T-12900	Sheet, Pointer	1
115	141-2-329T-05000	Reflector, Stereo Lamp	1
116	141-2-126T-25001	Back Lid	1
117	141-2-315T-14100	Reinforcement, Right Side Mtg.	1
118	141-2-310T-05000	Bracket, Reinforcement (117) Mtg.	2
119	141-2-315T-13900	Reinforcement, Center Mtg.	1
120	141-2-371T-08000	Bracket, PT Mtg.	1
121	141-2-464T-21300	Fixer	5
122	141-2-135T-52700	Cover, Voltage Select Switch	1
123	4-243T-78301	Power Supply Cord, AC	1
124	141-2-315T-14000	Reinforcement, Left Side	1
125	4-511T-08200	Meter, Signal	1
126	4-511T-08300	Meter, Tuning	1
127	4-235T-43900	Socket, Meter Connect	1
128		Ceramic 0.01μF 50WV, C710,711,712	3
129	141-2-382T-07000	Terminal 2 pin, Earth	2
130	141-2-753T-22000	Shaft, Power Switch Connection	1
131	141-2-521T-01600	Flywheel, Tuning	1
132	141-2-524T-07600	Bracket Flywheel (131) Mtg.	1
133	141-2-566T-06600	Tuning Shaft	1
134	141-2-453T-30500	Graphite Nylon Washer 4.1 x 6.5 x 0.13mm	2
135	141-2-421T-20900	Special Screw, Pulley Mtg.	5

Ref. No.	Part No.	Description	Q'ty
CABINET & CHASSIS			
136	141-2-661T-71300	Pulley	4
137	141-2-661T-71200	Pulley	1
138	141-2-310T-04700	Bracket, Pulley Mtg.	1
139	141-0-161T-18501	Push Button Assembly, Power Switch (141-0-161T-02900)	1
140	141-2-538T-07300	Drum	1
141	141-2-340T-00200	Rope 0.5 x 2000mm	1
142	141-2-855T-14800	Coil Spring, Rope Fixer	1
143	123-2-472R-10700	Lug, Earth	2
144	141-2-382T-10600	Terminal, Earth	1
145	123-2-457R-11700	Special Washer, Function Switch Mtg.	1
146	141-2-464T-08700	Fixer, Leadwire Dressing	5
147	141-0-161T-38300	Push Button Assembly, Function	7
148	141-2-464T-11800	Fixer, AC Cord	1
149	141-2-214T-01700	Bracket Frame	1
ELECTRICAL PARTS			
201	141-4-230T-16171	Printed Circuit Board Assembly, Dial Lamp	1
	4-612T-07371	├ Lamp, Dial	4
	4-237T-00171	└ Terminal, Wire Wrapping Pin	5
202	141-4-230T-62900	Printed Circuit Board Assembly, Power Switch	1
	141-2-365T-40001	├ Bracket Switch	1
	141-2-253T-12600	├ Joint	1
	141-2-381T-04200	├ Bracket Fuse	4
	4-234T-03671	├ Fuse 2.0AT	1
	4-231T-76571	├ Switch, Power	1
	4-234T-04471	├ Fuse 1.0AT	1
	4-223T-05400	├ Capacitor	1
	141-2-382T-07300	├ Terminal, Wire Wrapping Pin	7
	141-6-476T-11100	├ Indication Label	1
		├ Tapping Screw 3 x 8mm	2
		├ Pan Head Screw 3 x 6mm	2
		└ External Toothlock Washer 3mm	1
203	4-231T-37685	Switch, Voltage Select	1
204	141-2-383T-04800	Fuse Holder with Cover	1
205	4-234T-06171	Fuse 2.5AT	2
206	4-235T-24000	Socket, DIN	1
207	4-237T-07000	Terminal Board, Speaker Terminal	2
208	4-235T-39700	Socket, Phono RCA x 6	1
209	4-235T-39771	Socket, Tape RCA x 6	1
210	141-4-230T-21400	Printed Circuit Board Assembly, Antenna	1
L100	4-268T-00100	├ V.H.F Coil 75-300 ohms	1
	141-2-382T-05900	└ Terminal, 4 pin	1
211	4-251T-83500	Power Transformer	1
TUNER PCB ASSY			
212	141-4-230T-15502	Printed Circuit Board, Tuner	1
L104	4-257T-29202	Antenna Coil Assembly	1
L101	4-265T-03700	V.H.F. Coil	1
L102	4-265T-03800	V.H.F. Coil	1
L103	4-265T-03900	V.H.F. Coil	1
		Fiber Washer 3 x 10 x 1 mm	2
		Tapping Screw with Washer 3 x 12 mm	2
T201	4-256T-05140	I.F.T.	1
B102	123-2-472R-10900	Core	1

PARTS LIST

Ref. No.	Part No.	Description	Q'ty
TUNER PCB ASSY			
T202	4-256T-07940	I.F.T.	1
T203	4-256T-07871	I.F.T.	1
L202	4-253T-09300	Filter 18μH	1
L105	4-258T-15500	OSC Coil	1
CT3	4-224T-08800	Trimmer	1
	4-224T-08300	Variable Capacitor	1
	141-2-369T-05100	Bracket, Antenna Coil Mtg.	2
R227	4-222T-39477	Semi Fixed Resistor 50k(B)	1
R306	4-222T-39472	Semi Fixed Resistor 1k(B)	1
R309	4-222T-39474	Semi Fixed Resistor 5k(B)	1
L106,201	4-253T-08600	Filter 3μH	2
	4-256T-80500	Red 10.7MHz	
	4-256T-80571	Blue 10.67MHz	
	or	*same use parts	
CF201,202	4-256T-80572	I.F Filter Orange 10.73MHz	2
	4-256T-80573	Black 10.64MHz	
	4-256T-80574	White 10.76MHz	
L301,302	4-252T-02800	Choke Coil	2
	141-2-322T-35500	Shield Plate	1
	141-2-322T-35600	Shield Plate	1
S4,5	4-231T-63400	Switch, FM Muting & Mode	1
S3	4-231T-63500	Switch, Function	1
	4-237T-00100	Terminal	24
	4-236T-10271	Plug 4pin	1
	4-236T-10274	Plug 7pin	1
IC101		IC HA1138	1
IC201		IC LA1230	1
IC301		IC LA3350	1
IC701,801		IC TA7129P	2
Q101		FET 3SK59 G,R	1
Q102		Transistor 2SC535 B	1
Q103		Transistor 2SC930 E,Conv.	1
Q201		Transistor 2SC930 E, IF	1
Q202		Transistor 2SC536G, AUD	1
Q302,309		Transistor 2SC536 F or G, AUD	2
Q303,304		Transistor 2SA702 F	2
Q305,306 310		Transistor 2SC945 P	3
Q307,308		Transistor 2SC945 Por Q	2
D101,102 201,301		Diode IS2473	4
D103,202		Diode IS188 FM	2
D302,303		Diode IS2472	4
		CAPACITORS	
C108		Ceramic 2pF ±0.25pF 50WV	1
C106,116		Ceramic 4pF ±0.25pF 50WV	2
C114		Ceramic 6pF ±0.25pF 50WV N.P.O	1
C101		Ceramic 12pF ±10% 50WV	1
C105,123		Ceramic 12pF ±10% 50WV N750	2
C112		Ceramic 15pF ±5% N.P.O.	1
C115		Ceramic 20pF ±5% 50WV N330	1
C113		Ceramic 33pF ±5% 50WV N.P.O.	1
C208		Ceramic 33pF ±10% 50WV	1
C216,702 705,802 805		Ceramic 47pF ±10% 50WV	5
C109		Ceramic 100pF ±10% 50WV	1
C222		Ceramic 220pF ±20% 50WV	1
C311,314		Ceramic 560pF ±10% 50WV	2

Ref. No.	Part No.	Description	Q'ty
TUNER PCB ASSY			
C703,803		Ceramic 470pF ±20% 50WV	2
C103,107		Ceramic 0.001μF ±20% 50WV	2
C310,313		Ceramic 0.0022μF ±10% 50WV	2
C102,111 119,120 125,201 202,203 218,231		Ceramic 0.01μF +80 −20% 50WV	10
C110,124 213,217		Ceramic 0.022μF +80 −20% 50WV	4
C204,205 206,210 211,212 324		Ceramic 0.047μF +80 −20% 50WV	7
C122		Styrol 300pF ±5% 125WV	1
C309		Styrol 1500pF ±5% 125WV	1
C708,709 808,809		Mylar 0.001μF ±5% 50WV	4
C302,304 321,323		Mylar 0.0015μF ±10% 50WV	4
C318,319		Mylar 0.0033μF ±10% 50WV	2
C707,807		Mylar 0.0068μF ±5% 50WV	2
C117,121 221		Mylar 0.01μF ±20% 50WV	3
C320,322		Mylar 0.022μF ±10% 50WV	2
C219		Mylar 0.033μF ±20% 50WV	1
C316		Mylar 0.047μF ±20% 50WV	1
C225		Mylar 0.068μF ±20% 50WV	1
C306		Aluminum Electrolytic 0.22μF ±20% 10WV	1
C308		Aluminum Electrolytic 0.33μF ±20% 10WV	1
C307		Aluminum Electrolytic 0.47μF ±20% 10WV	1
C226,312 315		Electrolytic 0.47μF +150 −10% 16 to 50WV	3
C209		Electrolytic 1μF +150 −10% 25WV	1
C207,230 232		Electrolytic 1μF +150 −10% 16 to 50WV	3
C301		Electrolytic 4.7μF +100 −10% 16WV	1
C118		Electrolytic 10μF +100 −10% 16WV	1
C351		Electrolytic 10μF +100 −10% 35WV	1
C223		Electrolytic 33μF +100 −10% 16WV	1
C215		Electrolytic 100μF +100 −10% 16WV	1
C350		Electrolytic 100μF +100 −10% 35WV	1
C317		Electrolytic 470μF +100 −10% 16WV	1
C354		Electrolytic 1000μF +100 −10% 16WV	1
C706,806		Electrolytic 1μF +75 −10% 50WV	2
C701,801		Electrolytic 4.7μF +75 −10% 25WV	2
C704,804, 224		Electrolytic 47μF +100 −10% 16WV	3
C714		Electorlytic 220μF +100 −10% 50WV	1

Ref. No.	Part No.	Description	Q'ty
TUNER PCB ASSY			
		RESISTORS	
R103		Carbon Resistor 10 ohm	1
R110,214 234,312		Solid Resistor 56 ohm ±5% or ±10% 1/2W	4
R117,225 233,237 356		Carbon Resistor 100 ohm ±5% 1/4W	5
R106,111 206		Carbon Resistor 150 ohm ±5% 1/4W	3
R304		Carbon Resistor 220 ohm ±5% 1/4W	1
R351		Carbon Resistor 220 ohm ±5% or ±10% 1/4W	1
R205,207 220		Carbon Resistor 330 ohm ±5% 1/4W	3
R210		Carbon Resistor 470 ohm ±5% 1/4W	1
R201		Carbon Resistor 560 ohm ±5% 1/4W	1
R232		Carbon Resistor 680 ohm ±5% 1/4W	1
R315,321 705,805		Carbon Resistor 820 ohm ±5% 1/4W	4
R107,305		Carbon Resistor 1k ohm ±5% 1/4W	2
R230		Carbon Resistor 1.2k ohm ±5% 1/4W	1
R221		Carbon Resistor 1.5k ohm ±5% 1/4W	1
R203		Carbon Resistor 1.8k ohm	1
R213,216 219,702 802		Carbon Resistor 2.2k ohm ±5% 1/4W	5
R112,115 322,317		Carbon Resistor 2.7k ohm ±5% 1/4W	4
R217,302 303,308		Carbon Resistor 3.3k ohm ±5% 1/4W	4
R222		Carbon Resistor 3.9k ohm ±5% 1/4W	1
R360		Carbon Resistor 4.7k ohm ±5% 1/4W	1
R109		Carbon Resistor 5.6k ohm ±5% 1/4W	1
R211		Carbon Resistor 6.8k ohm ±5% 1/4W	1
R310,323 313,316 319,362 363,365 706,806		Carbon Resistor 8.2k ohm ±5% 1/4W	10
R113,202 307,314 320,353 359,364		Carbon Resistor 10k ohm ±5% 1/4W	8
R226,229 131		Carbon Resistor 12k ohm ±5% 1/4W	3
R114,215		Carbon Resistor 15k ohm ±5% 1/4W	2
R204,228		Carbon Resistor 18k ohm ±5% 1/4W	2
R209,311		Carbon Resistor 22k ohm ±5% 1/4W	2

Ref. No.	Part No.	Description	Q'ty
TUNER PCB ASSY			
R105		Carbon Resistor 33k ohm ±5% 1/4W	1
R108,218 709,809		Carbon Resistor 39k ohm ±5% 1/4W	4
R236,355, 357		Carbon Resistor 47k ohm ±5% 1/4W	3
R104,116 208		Carbon Resistor 56k ohm ±5% 1/4W	3
R701,801 354		Carbon Resistor 68k ohm ±5% 1/4W	3
R358		Carbon Resistor 82k ohm ±5% 1/4W	1
R101,212 223,224 318,324 361,710 810		Carbon Resistor 100k ohm ±5% 1/4W	9
R704,804		Carbon Resistor 180k ohm ±5% 1/4W	2
R703,803		Carbon Resistor 270k ohm ±5% 1/4W	2
R708,808		Carbon Resistor 470k ohm ±5% 1/4W	2
INDICATOR LAMP PCB ASSY			
213	141-4-230T-20771	Printed Circuit Board Assembly, Indicator Lamp	1
	4-612T-08100	Lamp, Function 6.3V 65mA	4
	4-612T-08200	Lamp, Stereo 6.0V 30mA	1
	4-237T-00100	Terminal, Wrapper Pin	9
	4-235T-44000	Socket 7 pin	1
DC POWER PCB ASSY			
214	141-4-230T-16402	Printed Circuit Board Assembly, DC Power	1
	141-2-382T-07300	Terminal, Wrapping Pin	14
	141-2-368T-11000	Heat Sink	1
		Tapping Screw 3 x 8mm	1
Q901		Transistor 2SD438E	1
Q902		Transistor 2SD330E	1
D901,902 903,904		Diode GP20D	4
D905		Diode 1N4003	1
D906		Diode WZ130	1
		CAPACITORS	
C901,902 903,904 905		Ceramic 0.01μF 50WV	5
C906,907	4-163T-01100	Electrolytic 4700μF 35WV	2
C910		Electrolytic 220μF 16WV	1
C909,911		Electrolytic 220μF 50WV	2
C908		Electrolytic 470μF 50WV	1
		RESISTORS	
R901		Solid State Resistor 47 ohm ±10% 1/2W	1
R902		Metal Oxide Film Resistor 150 ohm ±5% 3W	1
R906		Solid State Resistor 820 ohm ±10% 1/2W	1

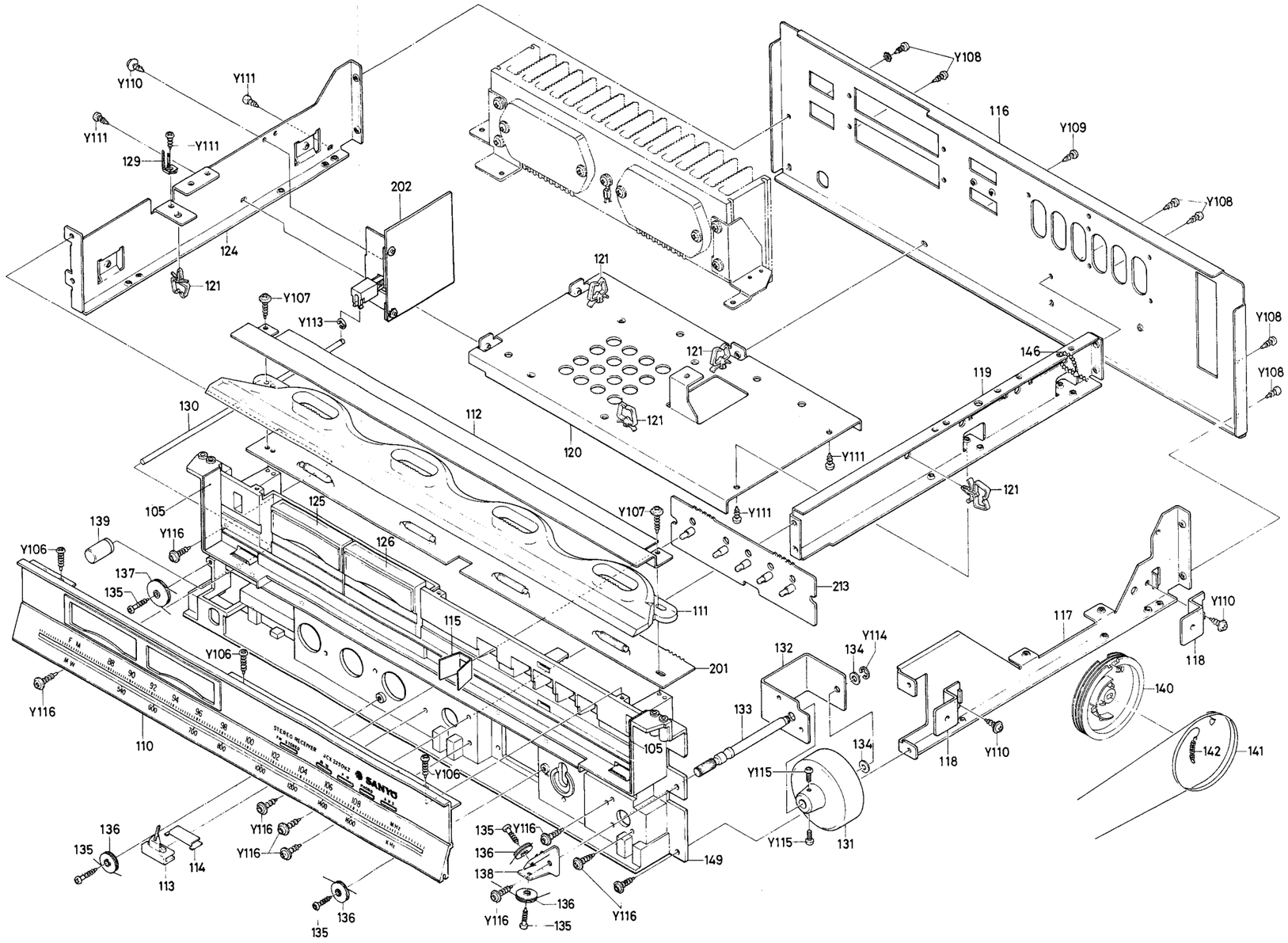
Ref. No.	Part No.	Description	Q'ty
DC POWER PCB ASSY			
R905		Solid State Resistor 1k ohm ±10% 1/2W	1
R903,904		Carbon Resistor 4.7k ohm ±5% 1/4W	2
R910		Solid State Resistor 5.6k ohm ±10% 1/2W	1
MAIN AMP PCB ASSY			
215	141-4-230T-16271	Printed Circuit Board Assembly, Main AMP	1
	141-2-368T-11100	Heat Sink	1
	141-2-310T-04800	Bracket, Heat Sink Right Side Mtg.	1
	141-2-310T-04900	Bracket, Heat Sink Left Side Mtg.	1
	141-2-310T-05100	Bracekt, Volume Mtg.	1
VR701	4-222T-54400	Variable Resistor 100K(N-M), Balance	1
VR702	4-222T-54300	Variable Resistor 100K(B), Volume	1
VR703, 704	4-222T-54500	Variable Resistor 100K(B), Bass & Treble	2
S4	4-231T-63800	Push Switch, Loudness	1
S11,12	4-231T-63700	Push Switch, Monitor 1-2	1
	141-2-382T-07300	Terminal, Wrapping Pin	28
	4-206T-01100	Power IC STK-078	2
	4-209T-01100	Posistor PTH487A, Temperature Security	1
		Washer Head Tapping Screw 3 x 8mm	5
		Tapping Screw 3 x 16mm	4
Q701,702 704,801, 802,804		Transistor 2SC1571G	6
Q703,803		Transistor 2SC945P or K	2
Q903		Transistor 2SC536F or G	1
D908,909 910		Diode DS442X	3
		CAPACITORS	
C737,837		Ceramic 2pF ±20% 50WV	2
C729,829		Ceramic 20pF ±20% 50WV	2
C722,822		Ceramic 330pF ±20% 50WV	2
C743,842		Ceramic 0.01μF ±20% 50WV	2
C735,835		Mylar 470pF ±20% 50WV	2
C725,825		Mylar 0.001μF ±5% 50WV	2
C726.727 826,827		Mylar 0.022μF ±5% 50WV	4
C721,821		Mylar 0.033μF ±5% 50WV	2
C742,842		Mylar 0.047μF ±5% 50WV	2
C723,823		Electrolytic 0.47μF +100 –10% 50WV	2
C732,733 734,832 833,834		Electrolytic 1μF +100 –10% 35WV	6
C724,728 731,824 828,831		Electrolytic 1μF +100 –10% 50WV	6
C740,741		Electrolytic 10μF +100 –10% 35WV	2
C736,836 913		Electrolytic 47μF +100 –10% 16WV	3
C730,830		Electrolytic 100μF +100 –10% 6.3WV	2
C738,739 838,839		Electrolytic 100μF +100–10% 35WV	4
C912		Electrolytic 470μF +100 –10% 35WV	1

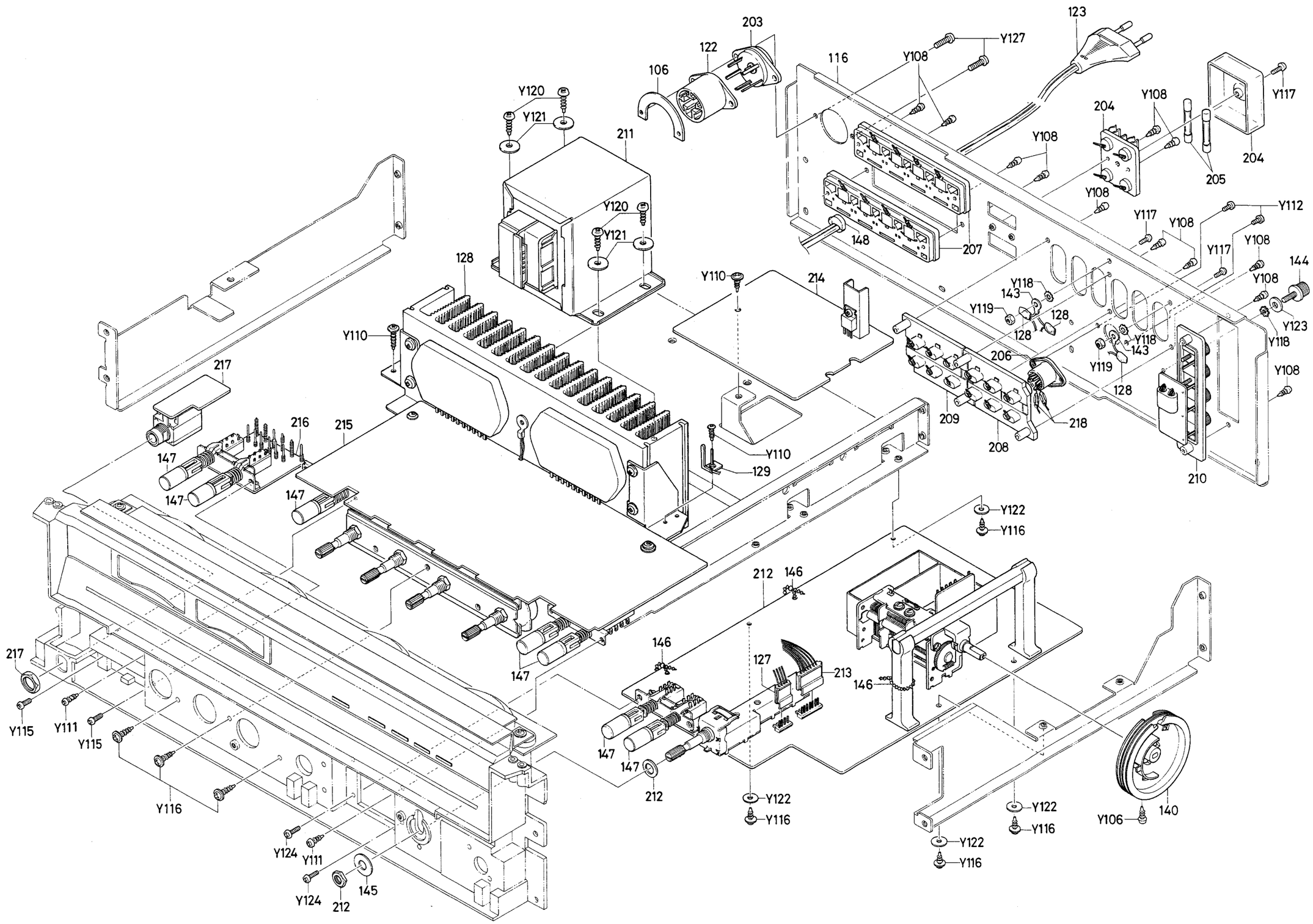
Ref. No.	Part No.	Description	Q'ty
MAIN AMP PCB ASSY			
		RESISTORS	
R754,854		Metal Oxide Film Resistor 5.6 ohm ±5% 1W	2
R752,753 852,853		Carbon Resistor 100 ohm ±5% 1/4W	4
R739,839		Carbon Resistor 680 ohm ±5% 1/4W	2
R722,725 741,746 748,822 825,841 846,848		Carbon Resistor 1k ohm ±5% 1/4W	10
R730,731 756,830 831,856		Carbon Resistor 2.2k ohm ±5% 1/4W	6
R750,850		Carbon Resistor 2.7k ohm ±5% 1/4W	2
R721,821		Carbon Resistor 3.3k ohm ±5% 1/4W	2
R911		Carbon Resistor 3.9k ohm ±5% 1/4W	1
R735,835		Carbon Resistor 4.7k ohm ±5% 1/4W	2
R728,738 745,828 838,845		Carbon Resistor 6.8k ohm ±5% 1/4W	6
R723,823		Carbon Resistor 12k ohm ±5% 1/4W	2
R732,733 734,832 833,834		Carbon Resistor 18k ohm ±5% 1/4W	6
R744,844		Carbon Resistor 22k ohm ±5% 1/4W	2
R729,829		Carbon Resistor 47k ohm ±5% 1/4W	2
R749,751 849,851		Carbon Resistor 56k ohm ±5% 1/4W	4
R743,843 909		Carbon Resistor 82k ohm ±5% 1/4W	3
R736,740 747,836 840,847		Carbon Resistor 100k ohm ±5% 1/4W	6
R742,842		Carbon Resistor 150k ohm ±5% 1/4W	2
R726,826		Carbon Resistor 680k ohm ±5% 1/4W	2
R724,824		Carbon Resistor 1M ohm ±5% 1/4W	2
R727,737 827,837		Carbon Resistor 1.8M ohm ±5% 1/4W	4
SP SWITCH PCB ASSY			
216	141-4-230T-20871	Printed Circuit Board Assembly, SP Switch	1
S15,16	4-231T-63600	Push Switch	1
	4-237T-00100	Terminal, Wrapper Pin	12

PARTS LIST

Ref. No.	Part No.	Description	Q'ty
HEADPHONE PCB ASSY			
217	141-4-230T-16371	Printed Circuit Board Assembly, Headphone	1
	4-235T-36771	Socket, Headphone	1
	4-237T-00100	Terminal, Wrapper Pin	3
R755,855		Metal Oxide Film Resistor 330 ohm ±5% 1W	2
		Carbon Resistor 270K ohm ±5%, 1/4W R710,820	2
SCREW MOUNTING			
Y101		Binding Head Tapping Screw 4 x 16 mm	4
Y102		Washer 4.5 x 13 x 1.2 mm	4
Y103		Tapping Screw with Washer 3 x 12 mm	9
Y104		Binding Head Tapping Screw	1
Y105		Binding Head Tapping Screw 3 x 6 mm	1
Y106		Tapping Screw 3 x 12 mm	4
Y107		Tapping Screw 3 x 16 mm	6
Y108		Binding Head Tapping Screw 3 x 10 mm	18
Y109		Binding Head Tapping Screw 3 x 8 mm	1
Y110		Tapping Screw with Washer 3 x 8 mm	7
Y111		Tapping Screw 3 x 8 mm	6
Y112		Pan Head Screw 2.6 x 6 mm	2
Y113		External "E" Ring 2.5 mm	1
Y114		External "E" Ring 3 mm	1
Y115		Pan Head Screw 3 x 6 mm	1
Y116		Tapping Screw with Washer 3 x 10 mm	16
Y117		Binding Head Tapping Screw 3 x 8mm	3
Y118		External Tooth Lock Washer 3 mm	3
Y119		Nut 3 mm	2
Y120		Tapping Screw with Washer 4 x 8 mm	4
Y121		Washer 4.5 x 13 x 1.2 mm	4
Y122	141-2-453T-01700	Fiber Washer 3 x 10 x 1 mm	5
Y123		Washer 3 x 10 x 0.5 mm	1
Y124		Pan Head Screw 3 x 8 mm	2
Y125		Pan Head Screw with Hexagon Hole 3 x 6 mm	2
Y126		External Tooth Lock Washer 2.6 mm	1
Y127		Binding Head Screw 3 x 12 mm	2

CHASSIS EXPLODED VIEW




203
122
106
123
Y127
116
Y108
Y120
Y121
211
Y108
204
Y108
Y117
204
205
Y108
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Y112
Y117
Y108
Y108
144
Y123
Y118
143
Y119
128
128
Y118
143
Y119
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206
Y108
209
218
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128
Y110
214
Y110
217
216
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129
Y110
Y122
Y116
212
146
146
127
213
146
217
Y115
Y111
Y115
Y116
147
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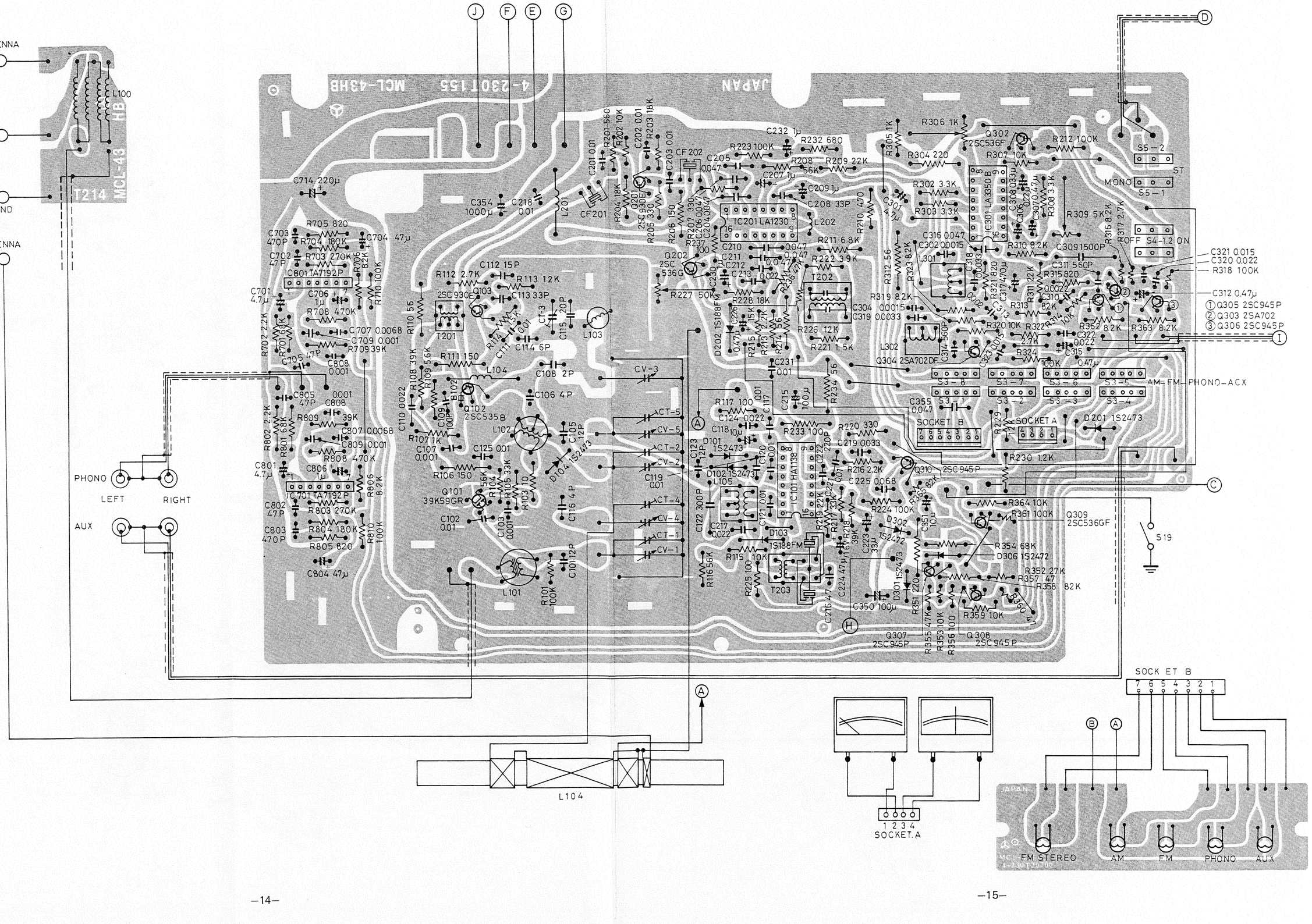
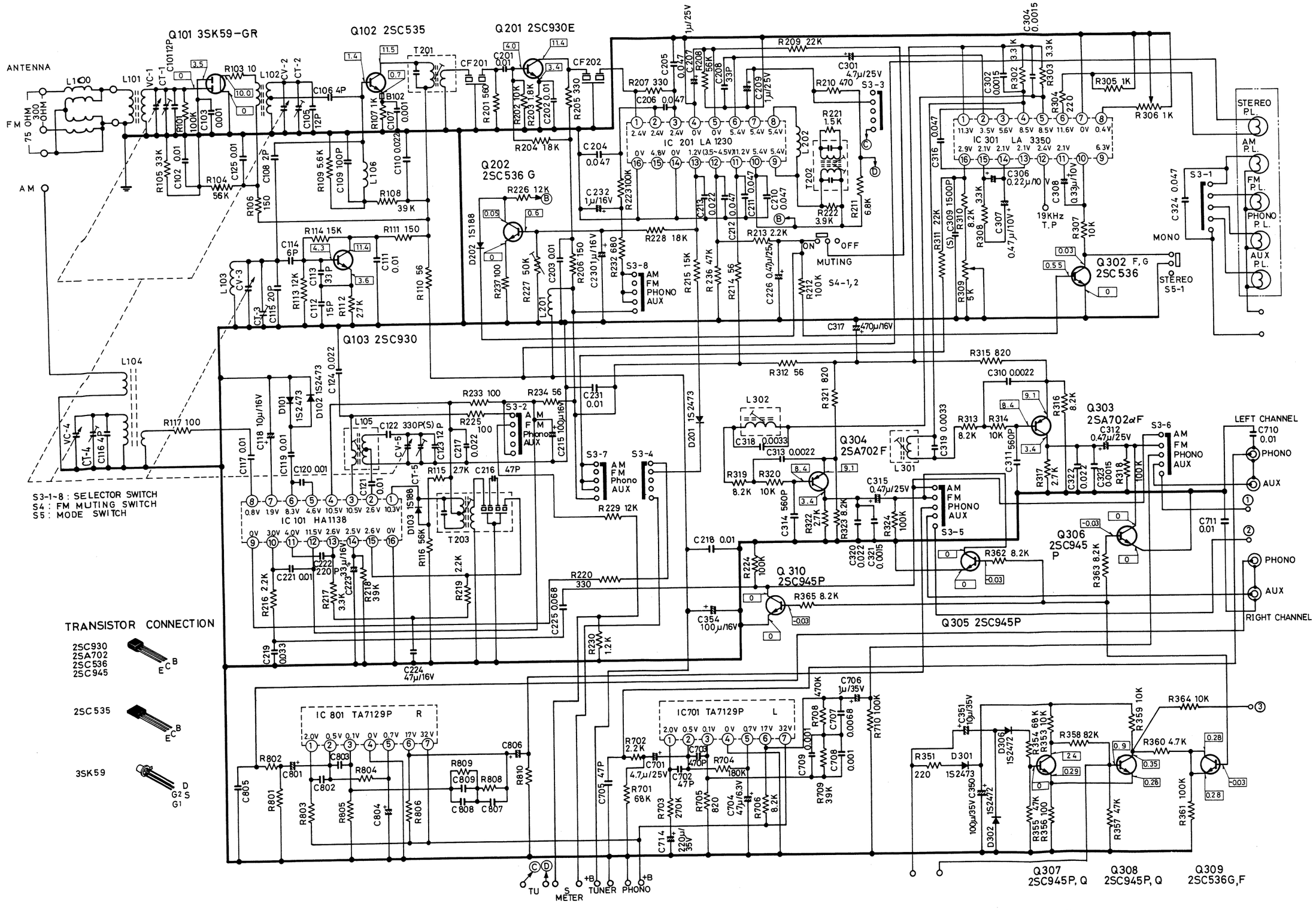
212
Y122
Y116
Y122
Y116
Y122
Y116
Y106
140
Y124
Y111
Y124
212
145


FM ANTENNA
300Ω
75Ω
GND
AM ANTENNA
PHONO
LEFT
RIGHT
AUX
L100
T214
MCL-43
4-230T155
MCL-43HB
JAPAN
IC801 TA7192P
IC701 TA7192P
IC201 LA1230
IC301 LA3350B
IC101 HA1138
Q101 39K59GR
Q102 2SC535B
Q103 2SC930E
Q202 2SC536G
Q301 47µ
Q302 2SC536F
Q303 2SA702
Q304 2SA702DF
Q305 2SC945P
Q306 2SC945P
Q307 2SC945P
Q308 2SC945P
Q309 2SC536GF
Q310 2SC945P
D101 1S2473
D102 1S2473
D103 1S188FM
D104 1S2473
D201 1S2473
D202 1S188FM
D301 1S2473
D302 1S2472
D306 1S2472
CF201
CF202
T201
T202
T203
L101
L102
L103
L104
L105
L201
L202
L301
L302
CV-1
CV-2
CV-3
CV-4
CV-5
CT-1
CT-2
CT-3
CT-4
CT-5
S5-2
ST
MONO
S5-1
OFF S4-1.2 ON
S19
S3-8
S3-7
S3-6
S3-5
S3-4
S3-3
S3-2
S3-1
AM-FM-PHONO-ACX
SOCKET A
SOCKET B
1 2 3 4
SOCK ET B
7 6 5 4 3 2 1
FM STEREO
AM
FM
PHONO
AUX
① Q305 2SC945P
② Q303 2SA702
③ Q306 2SC945P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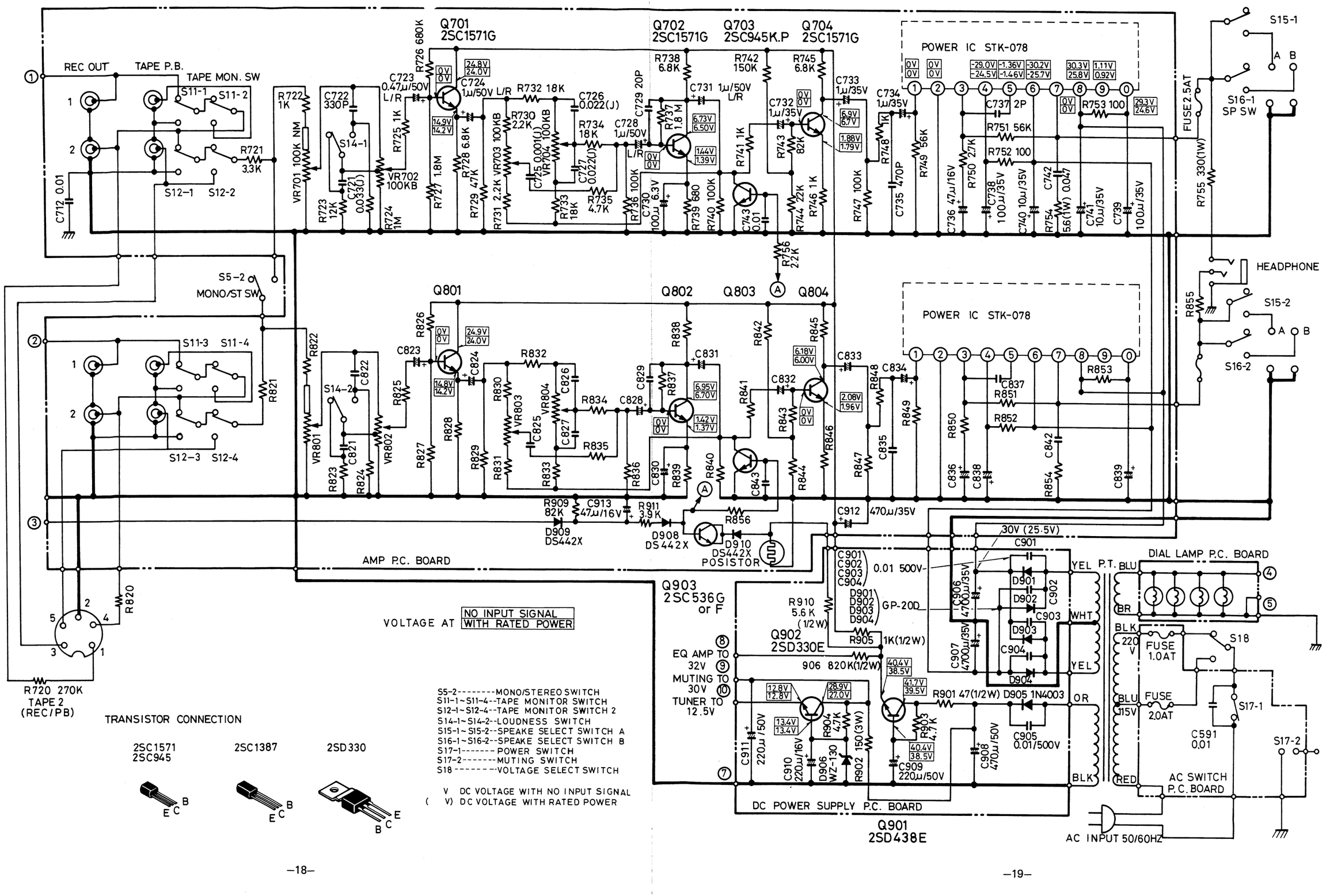
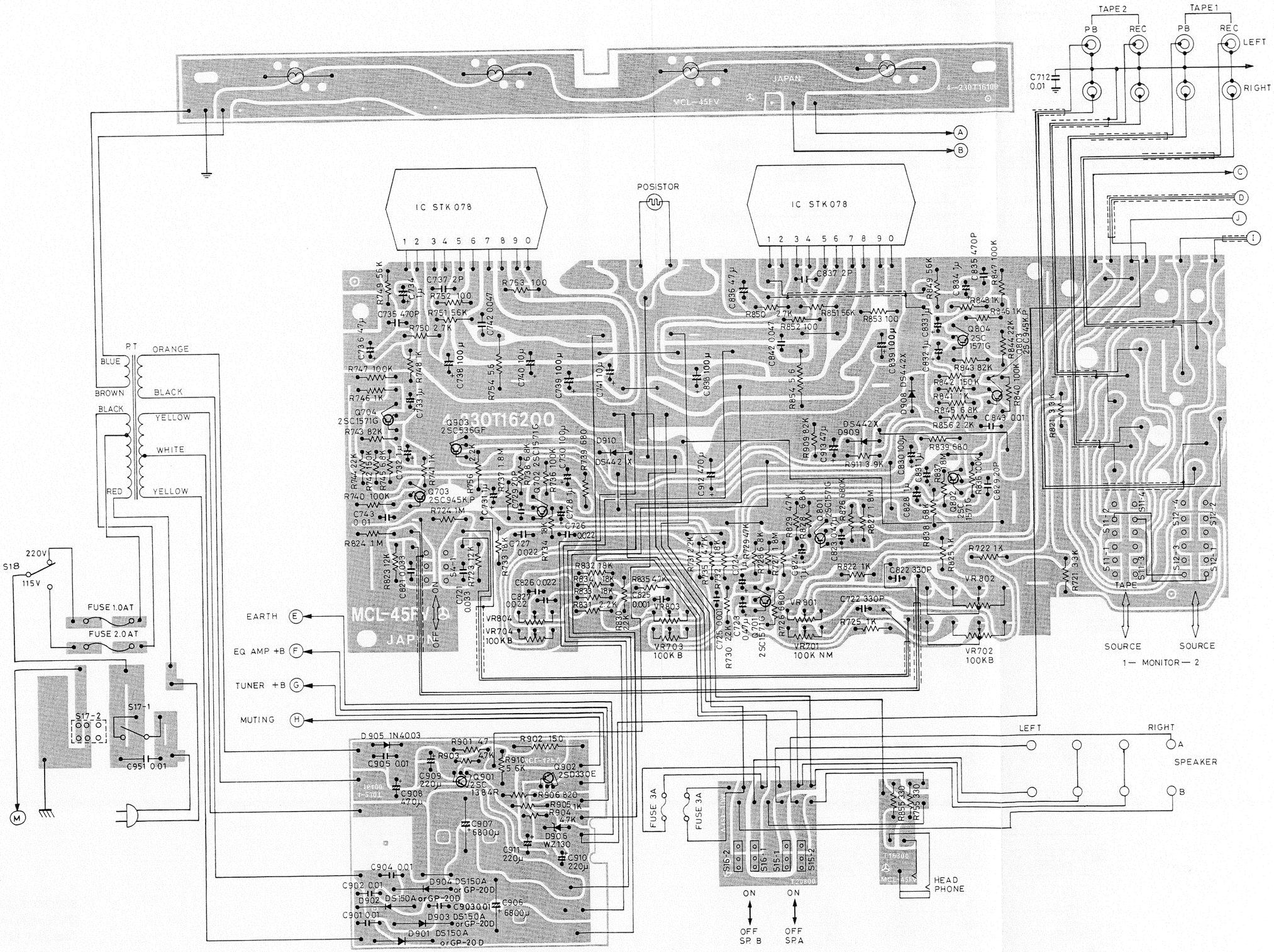
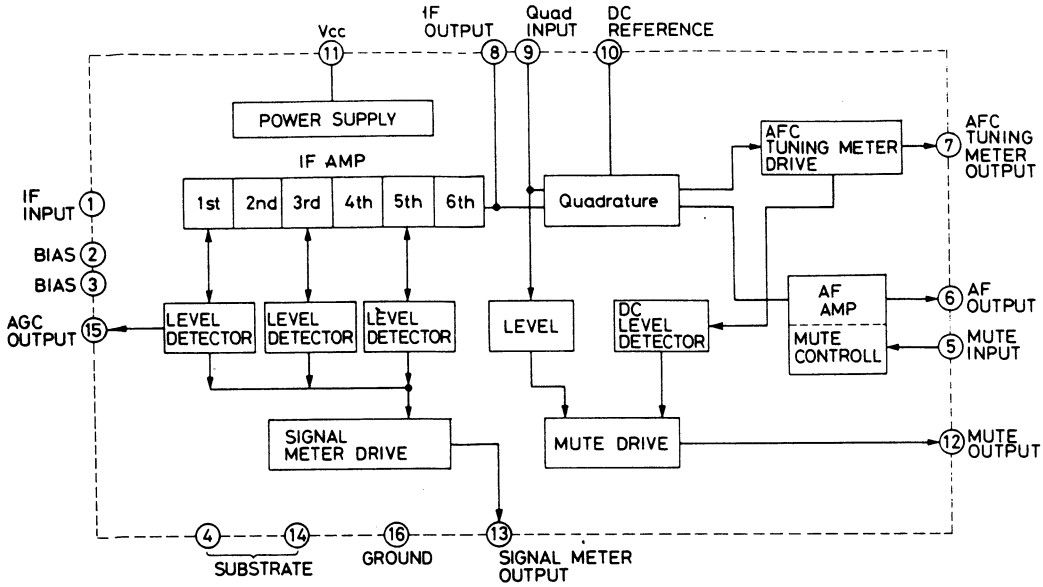
Q102 2SC535
Q201 2SC930E
Q202 2SC536 G
Q103 2SC930
Q302 F,G 2SC536
Q303 2SA702αF
Q304 2SA702 F
Q306 2SC945 P
Q310 2SC945P
Q305 2SC945P
Q307 2SC945P, Q
Q308 2SC945P, Q
Q309 2SC536G,F
IC 101 HA1138
IC 201 LA 1230
IC 301 LA 3350
IC 801 TA7129P R
IC701 TA7129P L
ANTENNA
FM 75 OHM 300 OHM
AM
MUTING
ON
OFF
STEREO P.L.
AM P.L.
FM P.L.
PHONO P.L.
AUX P.L.
MONO
19KHz T.P
LEFT CHANNEL
RIGHT CHANNEL
PHONO
AUX
TU
S METER
TUNER
PHONO
S3-1-8 : SELECTOR SWITCH
S4 : FM MUTING SWITCH
S5 : MODE SWITCH
TRANSISTOR CONNECTION
2SC930
2SA702
2SC536
2SC945
2SC535
3SK59


Q701 2SC1571G
Q702 2SC1571G
Q703 2SC945K.P
Q704 2SC1571G
POWER IC STK-078
REC OUT
TAPE P.B.
TAPE MON. SW
S11-1
S11-2
S12-1
S12-2
S14-1
S5-2
MONO/ST SW
S11-3
S11-4
S12-3
S12-4
S14-2
S15-1
S16-1
SP SW
FUSE 2.5AT
HEADPHONE
S15-2
S16-2
Q801
Q802
Q803
Q804
POWER IC STK-078
AMP P.C. BOARD
VOLTAGE AT NO INPUT SIGNAL / WITH RATED POWER
TRANSISTOR CONNECTION
2SC1571
2SC945
2SC1387
2SD330
S5-2--------MONO/STEREO SWITCH
S11-1~S11-4--TAPE MONITOR SWITCH
S12-1~S12-4--TAPE MONITOR SWITCH 2
S14-1~S14-2--LOUDNESS SWITCH
S15-1~S15-2--SPEAKE SELECT SWITCH A
S16-1~S16-2--SPEAKE SELECT SWITCH B
S17-1-------POWER SWITCH
S17-2-------MUTING SWITCH
S18 --------VOLTAGE SELECT SWITCH
V DC VOLTAGE WITH NO INPUT SIGNAL
(V) DC VOLTAGE WITH RATED POWER
Q903 2SC536G or F
Q902 2SD330E
Q901 2SD438E
EQ AMP TO 32V
MUTING TO 30V
TUNER TO 12.5V
30V (25.5V)
DIAL LAMP P.C. BOARD
P.T.
DC POWER SUPPLY P.C. BOARD
AC SWITCH P.C. BOARD
AC INPUT 50/60HZ
TAPE 2 (REC/PB)


MCL-45FV
JAPAN
4-230T16100
IC STK078
POSISTOR
TAPE 2
TAPE 1
PB
REC
LEFT
RIGHT
C712 0.01
A
B
C
D
J
I
PT
BLUE
BROWN
ORANGE
BLACK
YELLOW
WHITE
RED
220V
115V
S18
FUSE 1.0AT
FUSE 2.0AT
S17-1
S17-2
C951 0.01
EARTH
EQ AMP +B
TUNER +B
MUTING
E
F
G
H
M
4-230T16200
Q903 2SC536GF
Q704 2SC1571G
Q703 2SC945K,P
Q702 2SC1571G
Q801 2SC1571G
Q802 2SC1571G
Q804 2SC1571G
Q901 2SC1384R
Q902 2SD330E
D905 1N4003
D904 DS150A or GP-20D
D902 DS150A or GP-20D
D903 DS150A or GP-20D
D901 DS150A or GP-20D
D906 WZ130
D908 DS442K
D909 DS442X
D910 DS442X
VR801
VR802
VR803
VR804
VR701 100K NM
VR702 100KB
VR703 100K B
VR704 100K B
TAPE
SOURCE
SOURCE
1— MONITOR — 2
LEFT
RIGHT
A
B
SPEAKER
FUSE 3A
FUSE 3A
S16-2
S16-1
S15-1
S15-2
ON
OFF
SP B
ON
OFF
SP A
HEAD PHONE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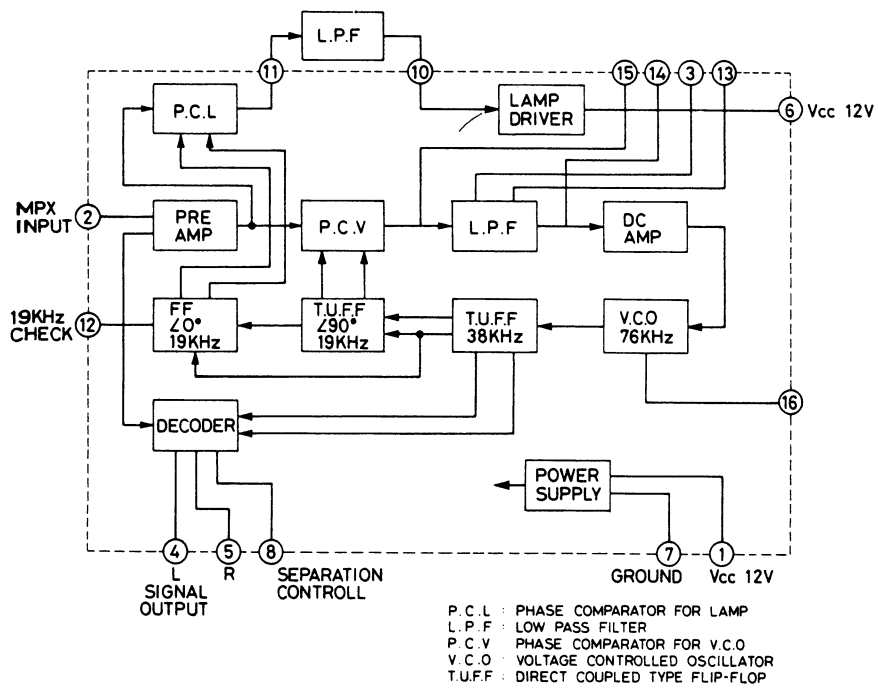
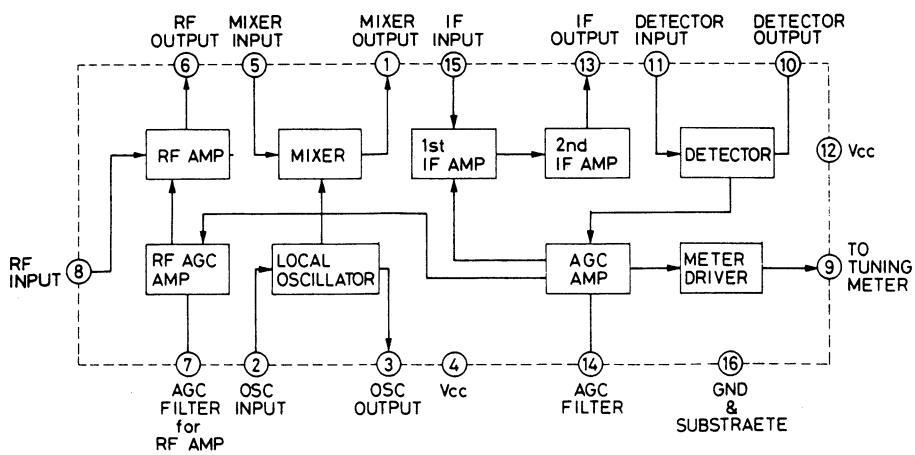
IF OUTPUT
Quad INPUT
DC REFERENCE
11
8
9
10
POWER SUPPLY
IF AMP
1st
2nd
3rd
4th
5th
6th
Quadrature
AFC TUNING METER DRIVE
AFC TUNING METER OUTPUT
7
IF INPUT 1
BIAS 2
BIAS 3
AGC OUTPUT 15
LEVEL DETECTOR
LEVEL DETECTOR
LEVEL DETECTOR
LEVEL
DC LEVEL DETECTOR
AF AMP
MUTE CONTROLL
6 AF OUTPUT
5 MUTE INPUT
SIGNAL METER DRIVE
MUTE DRIVE
12 MUTE OUTPUT
4
14
16
13
SUBSTRATE
GROUND
SIGNAL METER OUTPUT


L.P.F
11
10
15
14
3
13
P.C.L
LAMP DRIVER
6 Vcc 12V
MPX INPUT 2
PRE AMP
P.C.V
L.P.F
DC AMP
19KHz CHECK 12
FF 0° 19KHz
T.U.F.F 90° 19KHz
T.U.F.F 38KHz
V.C.O 76KHz
16
DECODER
POWER SUPPLY
4
5
8
7
1
L SIGNAL OUTPUT
R
SEPARATION CONTROLL
GROUND
Vcc 12V
P.C.L : PHASE COMPARATOR FOR LAMP
L.P.F : LOW PASS FILTER
P.C.V : PHASE COMPARATOR FOR V.C.O
V.C.O : VOLTAGE CONTROLLED OSCILLATOR
T.U.F.F : DIRECT COUPLED TYPE FLIP-FLOP


RF OUTPUT
MIXER INPUT
MIXER OUTPUT
IF INPUT
IF OUTPUT
DETECTOR INPUT
DETECTOR OUTPUT
6
5
1
15
13
11
10
RF AMP
MIXER
1st IF AMP
2nd IF AMP
DETECTOR
12 Vcc
RF INPUT 8
RF AGC AMP
LOCAL OSCILLATOR
AGC AMP
METER DRIVER
9 TO TUNING METER
7
2
3
4
14
16
AGC FILTER for RF AMP
OSC INPUT
OSC OUTPUT
Vcc
AGC FILTER
GND & SUBSTRAETE